EXPLORE CONTROL GRAPHICS

Directions

1. Be sure you are in the memo pad mode before you begin.
2. Lock the keyboard in the graphics character mode by using the CTRL-CAPS/LOWR combination. In order to use the characters on the ",", ".", and ";" keys, you must use the CTRL key. The remainder of the keys will automatically put the graphics characters on the screen.
3. Follow the directions for each challenge.

Challenges

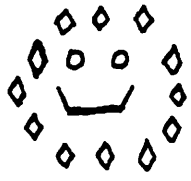
1. Substitute letters for the control graphics characters to decode the following message. The first word is done for you.

The

2. Use these keys:

   , T F G N

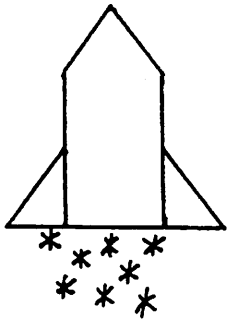
   To make:



3. Use these keys:

   F G * V B M

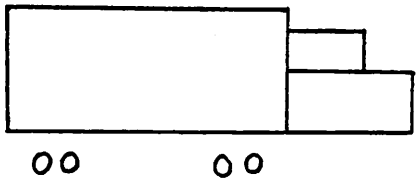
   To make:



4. Use these keys:

   Q R E Z C T M A X and (Shift =)

   To make:



CREATE WITH CONTROL GRAPHICS

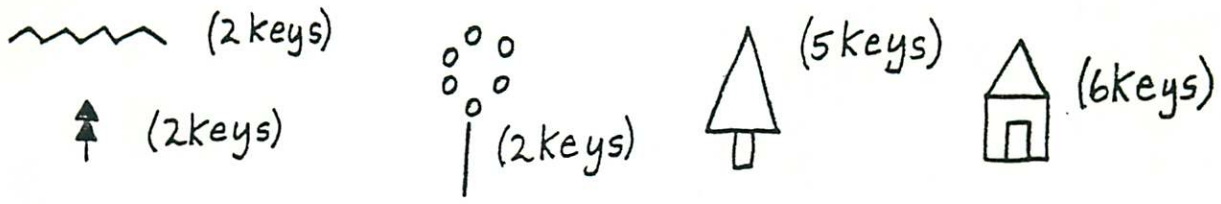
Directions

1. Be sure you are in the memo pad mode before you begin.
2. Lock the keyboard in the graphics character mode by using the CTRL-CAPS/LOWR combination. In order to use the characters on the ",", ".", and ";" keys, you must use the CTRL key. The remainder of the keys will automatically put the graphics characters on the screen.
3. Follow the directions for each challenge.

Challenges

1. Write a coded message to a friend using the control graphics characters. Ask the friend to decode the message. Each character should stand for the letter that shares its key. For example, ✚ = "s", ● = "t", and ┣ = "a", so ✚┣● = sat.

2. See if you can find the keys used to make each of the figures below. When you know how to make each figure, combine them to make a picture. Try adding a coded message as the name of your picture and see if a friend can decode the message.



3. Create your own picture. Use it to write a challenge for another camper or for your teacher.

GRAPHICS 0, 1, 2
(EXERCISES)

```
GR. 1
PRINT "HI!  MY NAME IS ___________"
PRINT #6; "THIS IS GRAPHICS MODE 1."
GR. 2
PRINT #6; "THIS IS"
PRINT #6; "GRAPHICS MODE 2."
PRINT #6; "CAPITAL LETTERS"
PRINT #6; "small letters"
```

Use the inverse video key for the words inside the quotation marks in the next two print statements.

```
PRINT #6; "CAPITAL LETTERS
PRINT #6; "IN INVERSE VIDEO"
PRINT #6; "small letters"
PRINT #6; "in inverse video"
```

```
GR. 1: POS. 7,5: PRINT #6; "POS. 7,5"
GR. 2: POS. 7,5: PRINT #6; "POS. 7,5"
```

```
10 GRAPHICS 2
20 POS. 4,2: PRINT #6; "**********"
30 POS. 4,3: PRINT #6; "*          *"
40 POS. 4,4: PRINT #6; "*__________*"
50 POS. 4,5: PRINT #6; "*          *"
60 POS. 4,6: PRINT #6; "**********"
```

Type GR. 0 and list the program. Change line 10 to:

```
10 GRAPHICS 2 + 16
```

add:

```
70 GOTO 70: REM This line keeps the display
on the screen.
```

EXPLORE POS.

1. This is a review of what POSITION does. POS. is an abbreviation for POSITION.

- POSITION tells the computer where to start printing on the screen.

- The format of its use is POSITION 10,3. The 10 tells the number of spaces across, and the 3 tells how many spaces down. A comma must be present between the numerals.

- In Graphics 0, there are 40 spaces across the screen, numbered 0 to 39. There are 24 spaces down on the screen numbered 0 to 23. Because the numbers start at 0, the first number after POSITION can be from 0 and 39, and the second number from 0 to 23.

2. Type in the following program and run it.

```
 10 POSITION 0,0: PRINT "   ---->"
 20 POSITION 1,0: PRINT "   ---->"
 30 POSITION 3,0: PRINT "   ---->"
 40 POSITION 5,0: PRINT "   ---->"
 50 POSITION 7,0: PRINT "   ---->"
 60 POSITION 9,0: PRINT "   ---->"
 70 POSITION 11,0: PRINT "   ---->"
 80 POSITION 13,0: PRINT "   ---->"
 90 POSITION 15,0: PRINT "   ---->"
100 POSITION 17,0: PRINT "   ---->"
110 POSITION 19,0: PRINT "   ---->"
```

3. Use POSITION and control graphics to draw a picture on the screen. It would be a good idea to use graph paper to plan this activity before you actually write the program.

GRAPHICS 0,1,2
CHALLENGES

Complete at least one of the challenges below. Show your completed program to the teacher or teaching assistant.

1. Write a program that uses the each of the following in some way. Print some interesting messages in different positions on the screen using a combination of capital letters, small letters, and inverse video.

```
GR. 1 (or 2) + 16
POSITION (POS.)
PRINT #6; "CAPITALS"
PRINT #6; "small"
PRINT #6; "CAPITALS/INVERSE VIDEO"
PRINT #6; "small/inverse video"
GOTO (To keep the display on the screen.)
```

2. Using what you learned in Activity #1, write a program that creates a title page for a book or a computer game. Include a title, author and any other information you think would be appropriate. This does not have to be a real book or game. Use your imagination.

3. Write a program that puts several boxes on the screen in different positions. Change the program so that words are in each of the boxes. Change the color of the words and boxes.

GRAPHICS 3 THROUGH 8
CAMPER COPY

```
GR. 3
COLOR 1
PLOT 1,1
PLOT 39,1
PLOT 39,18
PLOT 1,18
PLOT 1,1
```

Notice the position of the squares on the screen, then type:

```
DRAWTO 39,1
DRAWTO 39, 18
DRAWTO 1,18
DRAWTO 1,1
```

```
10 GR. 3 + 16
20 COLOR 1: REM Selects a color for the lines.
30 PLOT 18,1
40 DRAWTO 39,9
50 DRAWTO 18,18
60 DRAWTO 1,9
70 DRAWTO 18,1
80 GOTO 80: REM Keeps the display on the screen.
```

Simulated rainfall. Type in the program. Experiment by changing graphics modes, and by changing the "+" in line 30 to "=", "-", or "*".

```
10 GR. 3+16
20 FOR COUNTER=1 TO 84
30 PRINT #6,"+";
40 NEXT COUNTER
50 GR. 0
60 GOTO 10
```

GRAPHICS SUBROUTINES
CAMPER COPY

Type NEW before you begin.

TITLE1.GR

```
10300 REM *********Title page*********
10310 GRAPHICS 2+16:COLOR 2
10315 PRINT #6:PRINT #6:PRINT #6:PRINT #6
10320 PRINT #6;"          A"
10325 PRINT #6;"       VACATION"
10330 PRINT #6;"        STORY"
10340 PLOT 1,1
10345 DRAWTO 19,1
10350 DRAWTO 19,9
10355 DRAWTO 1,9
10360 DRAWTO 1,1
10370 RETURN
```

Type LIST"D:TITLE1.GR" to store the subroutine.

Type NEW before you begin.

RAIN.GR

```
10600 REM **********Rain***************
10605 FOR LOOP=1 TO 3
10610 GRAPHICS 3+16
10620 FOR COUNTER=1 TO 84
10630 PRINT #6,"+";
10640 NEXT COUNTER
10650 GRAPHICS 0
10660 NEXT LOOP
10670 RETURN
```

Type LIST"D:RAIN.GR" to store the subroutine.

GRAPHICS SUBROUTINES
CAMPER COPY

Type NEW before beginning.

```
10000 REM *****Going in circles*****
10010 GRAPHICS 7+16:COLOR 2
10020 FOR COUNTER=1 TO 50
10030 Z=Z+0.5
10040 X=SIN(Z)*25:Y=COS(Z)*22
10050 PLOT X+80,Y+45
10060 NEXT COUNTER
10070 RETURN
```

Store it using LIST"D:CIRCLE1.GR

Type NEW before beginning.

```
29000 REM **********Wait Loop**********
29010 FOR WAIT=1 TO 500:NEXT WAIT
29020 RETURN
```

Store it using LIST"D:WAIT.LP".

```
10100 REM *******Author Page*********
10110 GRAPHICS 2+16
10120 POSITION 4,2:PRINT #6;"**************"
10130 POSITION 4,3:PRINT #6;"*            *"
10135 POSITION 4,4:PRINT #6;"*     BY     *"
10140 POSITION 4,5:PRINT #6;"*            *"
10150 POSITION 4,6:PRINT #6;"* Your  Name *"
10155 POSITION 4,7:PRINT #6;"*            *"
10160 POSITION 4,8:PRINT #6;"**************"
10170 RETURN
```

Store it using LIST"D:AUTHOR.GR".

GRAPHICS MODES CHART

MODE	DESCRIPTION	SIZE
GRAPHICS 0	Text mode. Regular type. One color.	40 x 24
GRAPHICS 1	Text mode. Large type. Double width. Five colors.	20 x 20 (split) 20 x 24 (full)
GRAPHICS 2	Text mode. Largest type. Double width. Double height. Five colors.	20 x 10 (split) 20 x 12 (full)
GRAPHICS 3	Large graphics squares. Four colors. Not much memory used. Cannot make detailed drawings.	40 x 20 (split) 40 x 24 (full)
GRAPHICS 4	Smaller graphics points. Two colors, but less memory memory than GR. 5.	80 x 40 (split) 80 x 48 (full)
GRAPHICS 5	Smaller graphics points. Four colors, but uses twice as much memory as GR. 4.	80 x 40 (split) 80 x 48 (full)
GRAPHICS 6	Moderately high resolution Two colors, but uses half as much memory as GR. 7.	160 x 80 (split) 160 x 96 (full)
GRAPHICS 7	Moderately high resolution Four colors, but uses twice as much memory as GR. 6.	160 x 80 (split) 160 x 96 (full)
GRAPHICS 8	High resolution. Two colors. Lots of memory used. Best for detailed drawings.	320 x 160 (split) 320 x 192 (full)